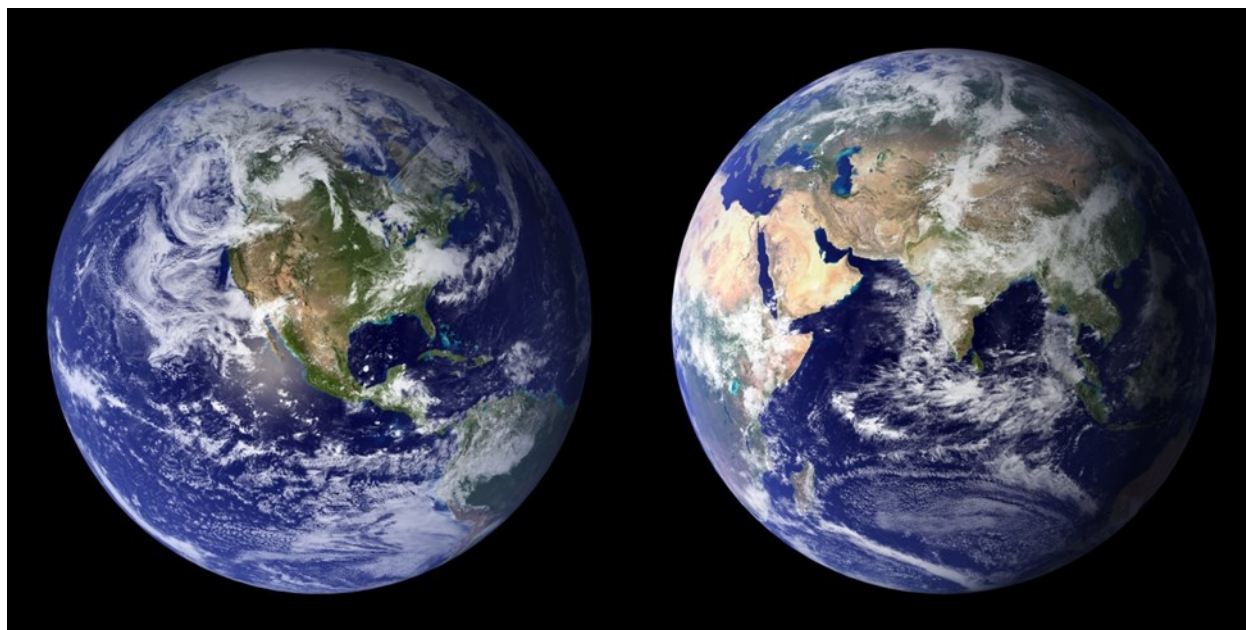


The 2001 Blue Marble Image of the Earth



By Don Hillger and Garry Toth

NASA's 2001 Blue Marble composite images of the Western and Eastern Hemispheres, respectively.

When the authors published their first article* on the Blue Marble Image of the Earth, we thought that the 1972 Apollo-17 Blue Marble was the only such image that was widely reproduced on postage stamps and covers. However, the Blue Marble name is not applied to that 1972 photograph alone. Another official NASA Blue Marble was created in 2001, this time one that covers more of the Earth, with views of both the Eastern and Western Hemispheres.

This new Blue Marble image is not a single photograph, but is rather a composite from numerous true-colour images acquired by the Earth Observation Satellites (EOS) Terra (EOS-AM) and Aqua (EOS-PM). On board both satellites are Moderate Resolution Imaging Spectroradiometer (MODIS) instruments that take continuous visible and infrared images that cover the entire surface of the Earth every 1 to 2 days from the sun-synchronous polar orbit of each EOS.

From MODIS images, none of which sees more than a 2330 km wide swath of the Earth at any time, computer software was able to piece together thousands of "granule" images, as they are known, each of which contains 5 minutes of data. To create the Blue Marble image the individual images are stitched together and any gaps between orbits are filled with imagery from previous or later orbits. The resulting composite has land surface, ocean, and sea ice features acquired from June through September 2001. Cloud features were acquired on two separate days: 29 June 2001 for the Northern Hemisphere, and 16 November 2001 for the Southern Hemisphere.

The 2001 Blue Marble is presented in two parts, with views of

the Western and Eastern Hemispheres. The Western Hemisphere view is tilted south so that more of the Northern Hemisphere is shown, with emphasis on North America, and even the North Pole region can be seen. The Eastern Hemisphere image is tilted south, but less drastically, so that none of Antarctica can be seen, while Asia, Europe and part of Africa are clearly visible.

The 2001 Blue Marble on postal items



Bulgaria (Scott 4426, Michel BL291, 2007)

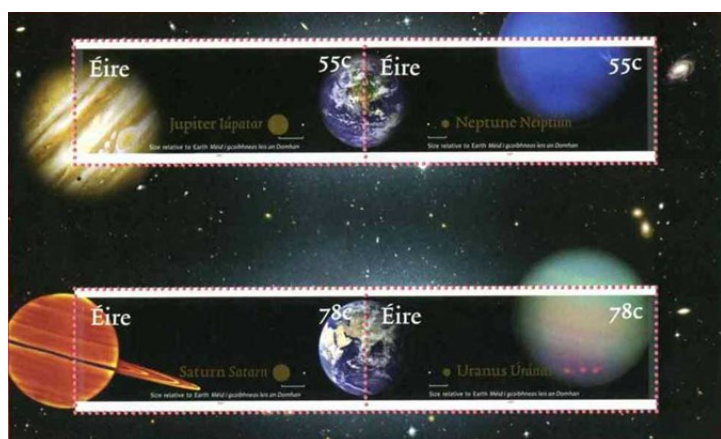
About 60 items have been found with the 2001 Blue Marble image; a representative sample of the reproductions will be presented in this article. Readers who wish to examine the full set of items are referred to the authors' website at the URL found at the end of this article. The Blue Marble on each item can be identified by the patterns of land, water, ice and cloud, even in cases where only portions of the full disk image are provided.

* Cf *Orbits* #97 and #104

The first reproductions of the 2001 Blue Marble date from 2007, several years after its introduction. An example is found on a souvenir sheet of one stamp from Bulgaria (Scott 4426, Michel BL291) issued in 2007. The large image of the Earth is easily identified as the 2001 Blue Marble image of the Eastern Hemisphere. This sheet was issued for the 50th anniversary of the launch of Sputnik-1 in 1957.



Likewise, Romania issued a souvenir sheet of one stamp (Scott 5000, Michel BL411, designed by ASSS member Alec Bartos) in 2007 for the same Sputnik-1 anniversary. This time only about a quarter of the Blue Marble image is shown, in the lower-right of the stamp and the margin. In this case the image is the Western Hemisphere view of the Blue Marble. To accompany this sheet, Romania issued two other sheets of 8 stamps (not shown here), with the 2001 Blue Marble image in the same lower-right location as in the sheet that is shown, but mostly hidden behind the Sputnik-1 stamps in each sheet.

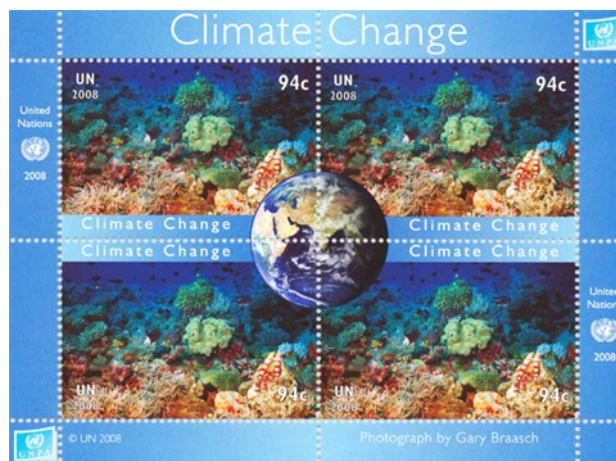


Ireland issued a sheet of four stamps (Scott 1722b, Michel BL66) in 2007 which shows both hemispheres of the 2001 Blue Marble. Each of the two Blue Marble hemispheres appears at the perforated edge separating a pair of stamps which otherwise show planets of our solar system.

St. Kitts issued a sheet of four stamps (Scott 667, Michel 941-944) in 2007 to commemorate the landing of Luna-9 on the moon. In the upper-left margin of that sheet is the Western Hemisphere 2001 Blue Marble image (right)....



In 2008 the United Nations in New York issued two sheets of 4 stamps (Scott 968-969, Michel BL29-BL30) with the 2001 Blue Marble eastern view of the Earth in the centre of each sheet. The sheets have a climate change theme. Variations on the sheets are also available in a souvenir booklet of 6 panes of 4 stamps, each of which is similar to one of the two sheets that are shown.



Similar sheets and souvenir booklets were issued by the UN offices in Geneva and Vienna (not shown here). Those item numbers are Scott 492-493, Michel BL24-BL25 for Geneva, and Scott 434-435, Michel BL23-BL24 for Vienna.

In 2009 Gabon issued a souvenir sheet of one stamp (Scott unlisted, Michel unlisted) with the Blue Marble eastern view

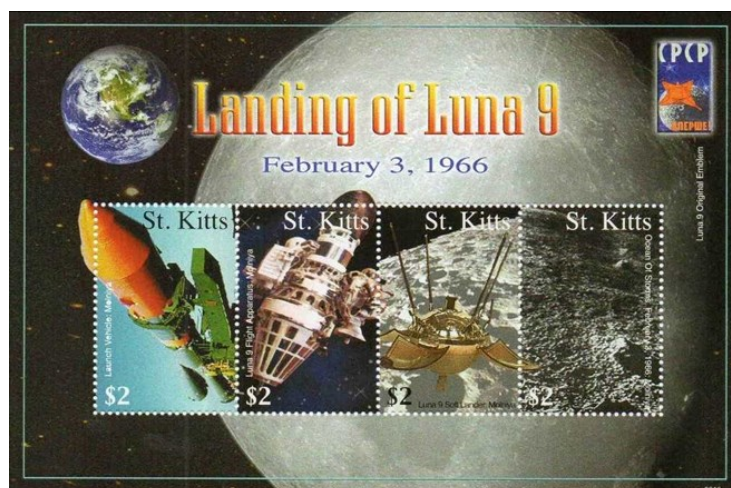




image in the left margin. The sheet also references Sputnik-1, the Hubble Space Telescope, the Space Shuttle, a Lunokhod lunar rover, Galileo Galilei, and other manned spaceflight elements matching the conquest of space theme.

Also in 2009 Mexico issued a stamp (Scott 2620, Michel 3500) with the 2001 Blue Marble with subdued colors and some artistic license, so that it might not at first glance be recognized as the Blue Marble. However, the clouds and land features are indeed from the western view of the Blue Marble. The theme of the stamp is UN Environment Program (UNEP) World Environment Day, which is the 5th of June each year, the day that the first UN Conference on the Human Environment began, in 1973.



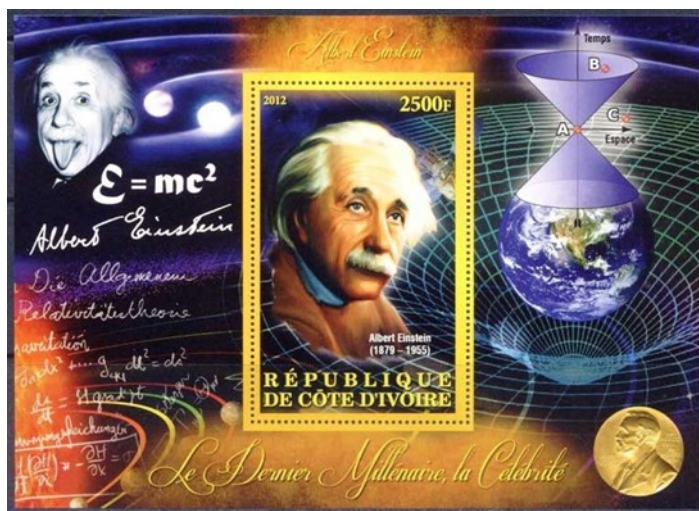
In 2010 Turkey issued a stamp (Scott 3227, Michel 3827) featuring the Turkish Rasat (an Earth observation micro-satellite), which was launched in 2011. The partial view of the 2001 Blue Marble in the background is from the Western Hemisphere image.

Mongolia issued a stamp (Scott 2705, Michel 3771) in 2011 with the western view of the Blue Marble behind Yuri Gagarin, the first man in

space. Besides having less detail, the colors on the 2001 Blue Marble image are altered, with the oceans more blue than

purple and the land greener over much of North America.

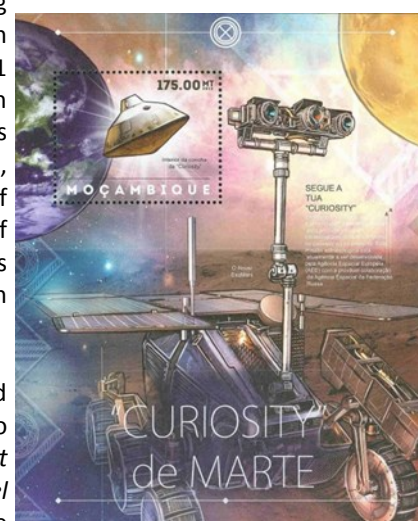
In 2012 the Ivory Coast issued a souvenir sheet of one stamp (Scott unlisted, Michel unknown) with Albert Einstein as a premier celebrity of the 20th Century. The right margin has a space-time conical section on top of the western view of the 2001 Blue Marble.



Another 2012 item from Jordan (Scott 2127, Michel 2168) was issued for World Telecommunications Day, celebrated annually on 17 May. The western view of the 2001 Blue Marble is easily recognized.



Mozambique issued a souvenir sheet of one stamp (Scott 2737, Michel BL705) in 2012 showing the Curiosity rover on Mars. The partial 2001 Blue Marble image in the upper-left margin is the western view, showing only portions of the eastern coast of North America and parts of Central and South America.



In 2013, Djibouti issued two sheets of two stamps each (Scott unknown, Michel unknown) with the western view of the 2001 Blue Marble in the upper-left margin. The two sheets feature various early satellites including the US Explorer-1 and Vanguard-1 on one sheet, and the British X-3/Prospero and the French A-1/Asterix on the other sheet.



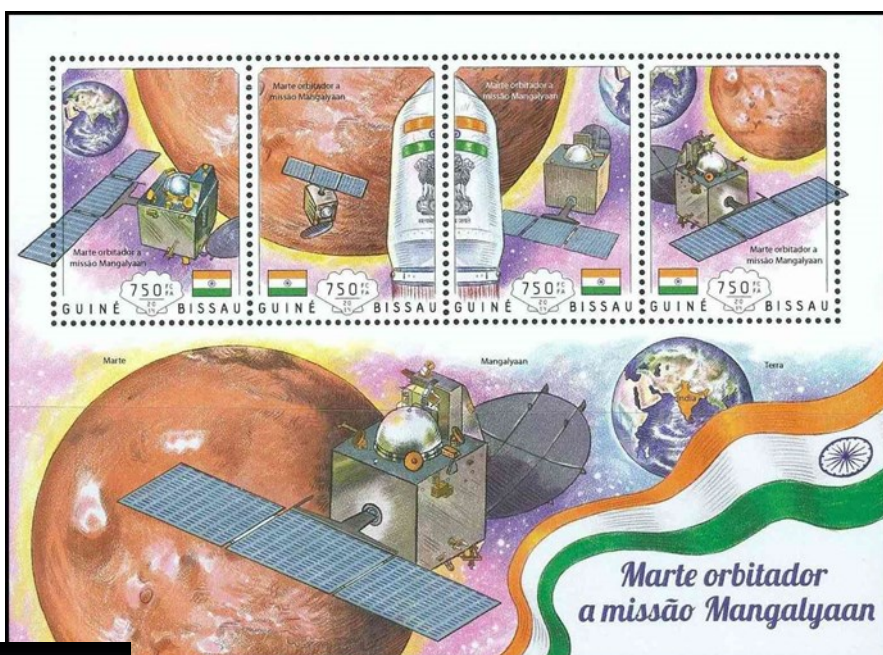
Djibouti (Scott unknown, Michel unknown, 2013)

Sri Lanka (Scott unknown, Michel unknown, 2014)



Guinea-Bissau issued a sheet of 4 stamps (Scott unknown, Michel unknown) in 2014 featuring the Indian Mangalyaan satellite mission to orbit Mars. The eastern view of the 2001 Blue Marble is on three of the four stamps and in the lower-right margin of the sheet (with India highlighted and annotated in that reproduction).

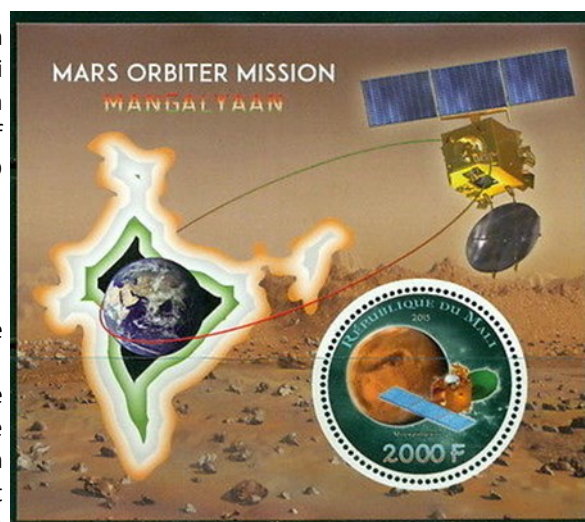
A sheet of four stamps was issued by Mozambique in 2014 (Scott unknown, Michel unknown) with a global warming theme. The western view of the 2001 Blue Marble is in the background in full color, but a smaller version of that same image is also found in the camera lens in the lower-left margin. That image is identified by the cloud patterns but has been modified to include only tones of brown and yellow.



Another item from 2014 is a stamp from Sri Lanka (Scott unknown, Michel unknown) with the eastern view of the 2001 Blue Marble image. It's part of a National Stamp Exhibition sheet of 10 stamps (not shown here) that contains

the Solar System, including the Sun and Moon, and the 8 planets that remain after Pluto was demoted from its planet status, (shown top centre).

Early in 2015, Mali issued a sheet of one stamp (Scott unknown, Michel unknown) with the eastern view of the 2001 Blue Marble in the left margin on



top of an outline of India. Otherwise, the sheet features the Indian Mangalyaan Mars orbiter satellite on both the round stamp and in the upper-right margin. This is the same satellite that is on the Guinea-Bissau sheet already discussed.

A couple of variations on the standard reproductions normally found

For something a bit different, a reproduction of the Blue



Marble on a stamp from Burundi (Scott 1078d, Michel 2429) issued in 2012, one of a sheet of 4 stamps (not shown here), presents the Blue Marble 2001 image as an Earthrise as seen from the Moon. The authors discussed Earthrise imagery on postal items in one

of our previous articles*. A few of those Earthrise items included the 1972 Blue Marble as the image of the Earth: a contrived combination of images! Readers are referred to that article for further information (see reference at end). However, the Burundi item is only one that has been found with the 2001 Blue Marble presented as an Earthrise seen from the Moon.

And finally, all the postal items presented so far show reproductions of either the Eastern or Western Hemispheres of the 2001 Blue Marble, with the following exception. A strip of 2 stamps from Cyprus in 2009 (Scott 1109, Michel 1150-1151) contains both the Western Hemisphere view of North and South America (on the left-hand stamp) and another view of the Earth centred over Europe and Africa (on the right-hand stamp), a sector not yet found on any other postal items. The Cyprus pair is shown together with the upper-right margin from the sheet of eight that contains 4 strips of 2 stamps. That margin contains the same Europe-Asia-centered view of the 2001 Blue Marble as on the right-hand stamp of the pair. The lower-left margin of that sheet shows the same Western Hemisphere view that is found on the left-hand stamp as well as on many other postal items.

Yet another Blue Marble in 2012!

In 2012 NASA created another set of Blue Marble images (not shown here), this time composited from Visible InfraRed Imaging Radiometer Suite (VIIRS) imagery from the Suomi National Polar-orbiting Partnership (S-NPP) satellite. While no reproductions of this latest Blue Marble image have been found on any postal items at the time of writing of this article, the authors expect it's just a matter of time before something will be discovered and added to our checklist of Blue Marble images on the Web.

Previous 1972 Blue Marble and Earthrise articles*

Hillger, D., and G. Toth, 2013: The Blue Marble image of the Earth, *Orbit*, (97), (March), 10-14.

Hillger, D., and G. Toth, 2015: Earthrise images from the Moon, *Orbit*, (104), (January), 3-8.

(NASA images like most US government products are for the benefit of everyone, so usually open for all to use).

Additional online information

A checklist of postal items showing the Blue Marble image is available at <http://rammb.cira.colostate.edu/dev/hillger/satellite-images.htm>, with separate sections for the 1972 and 2001 Blue Marble items. For the 1972 image more than 150 items are listed from some 50 countries, and for the 2001 image about 60 items are listed from about 15 countries.

The authors would like to hear from anyone who knows of additional reproductions of the Blue Marble image on postal items, as the authors will update the online details as new information is received. E-mail correspondence with the authors is welcomed.

